

Amendments to the Specification

Please replace paragraphs [0006]-[0010] with amended paragraphs [0006]-[0010]:

[0006] **Figure 1.** BFA4 cDNA sequence (SEQ ID NO.:1).

[0007] **Figure 2.** BFA4 amino acid sequence (SEQ ID NO.:2).

5 [0008] **Figure 3.** BCY1 nucleotide (A; SEQ ID NO.:3) and amino acid (B; SEQ ID NO.:4) sequences.

[0009] **Figure 4.** BFA5 cDNA sequence (SEQ ID NO.:5).

[0010] **Figure 5.** BFA5 amino acid sequence (SEQ ID NO.:6).

10 *Please replace paragraph [0039] with amended paragraph [0039]:*

[0039] A fusion motif may enhance transport of an immunogenic target to an MHC processing compartment, such as the endoplasmic reticulum. These sequences, referred to as transduction or transcytosis sequences, include sequences derived from HIV tat (see Kim et al. 1997 J. Immunol. 159:1666), *Drosophila* antennapedia (see Schutze-Redelmeier et al. 1996 J. Immunol. 157:650), or
15 human period-1 protein (hPER1; in particular, SRRHHCRSKAKRSRHH (SEQ ID NO: 105)).

Please replace paragraph [0082] with amended paragraph [0082]:

[0082] A library of 100 peptides from the BFA5/NYBR-1 coding sequence that are predicted to be medium to high binders to HLA-A*0201 were designed using Rammensee and Parker algorithms.
20 The library was sub-divided into 10 pools of ten peptides (**Table III**), and each pool was used to activate 10 different T cell cultures after pulsing peptides on to mature autologous dendritic cells. Two experiments were performed with the library of BFA5/NYBR-1 peptides demonstrating immunoreactivity in HLA-A*0201 human T cells, as described below.

TABLE III

BFAS Peptide Pools

Peptide Group	CLP number	Sequence	SEQ ID	Peptide Group	CLP number	Sequence	SEQ ID
BFA5 Group 1	2983	LMDMQTFKA	<u>7</u>	BFA5 Group 6	3033	FESSAKIQV	<u>53</u>
	2984	KVSIPTKAL	<u>8</u>		3034	GVTAEHYAV	<u>54</u>
	2985	SIPTKALEL	<u>9</u>		3035	RVTSNKT KV	<u>55</u>
	2986	LELKNEQTL	<u>10</u>		3036	TVSAKDVCV	<u>56</u>
	2987	TVSAKDVCL	<u>11</u>		3037	KSQEPAFHI	<u>57</u>
	2988	SVPNKALEL	<u>12</u>		3038	KVLIAENTM	<u>58</u>
	2989	CETVSQKDV	<u>13</u>		3039	MLKLEIATL	<u>59</u>
	2990	KINGKLEES	<u>14</u>		3040	EILSVAKL	<u>60</u>
	2991	SLVEKTPDE	<u>15</u>		3041	MLKKEIAML	<u>61</u>
	2992	SLCETVSQK	<u>16</u>		3042	LLKEKNEEI	<u>62</u>
BFA5 Group 2	2993	EIDKINGKL	<u>17</u>	BFA5 Group 7	3043	ALRIQDIEL	<u>63</u>
	2994	MLLQQNV DV	<u>18</u>		3044	KIREELGRI	<u>64</u>
	2995	NMWLQQQLV	<u>19</u>		3045	TLKLKEESL	<u>65</u>
	2996	FLVDRKCQL	<u>20</u>		3046	ILNEKIREE	<u>66</u>
	2997	YLLHENCML	<u>21</u>		3047	VLKKKLS EA	<u>67</u>
	2998	SLFESSAKI	<u>22</u>		3048	GTSDKIQCL	<u>68</u>
	2999	KITIDIHFL	<u>23</u>		3049	GADINLVDV	<u>69</u>
	3000	QLQSKNMWL	<u>24</u>		3050	ELCSVRLTL	<u>70</u>
	3001	SLDQKLFQL	<u>25</u>		3051	SVESNLNQV	<u>71</u>
	3002	FLIKINANA	<u>26</u>		3052	SLKINLNYA	<u>72</u>

Peptide Group	CLP number	Sequence	SEQ ID	Peptide Group	CLP number	Sequence	SEQ ID
BFA5 Group 3	3003	KILDTVHSC	<u>27</u>	BFA5 Group 8	3053	KTPDEAASL	<u>73</u>
	3004	SLSKILDV	<u>28</u>		3054	ATCGMKVSI	<u>74</u>
	3005	ILIDSGADI	<u>29</u>		3055	LSHGAVIEV	<u>75</u>
	3006	KVMEINREV	<u>30</u>		3056	EIAMLKLEI	<u>76</u>
	3007	KLISHGAVI	<u>31</u>		3057	AELQMTLKL	<u>77</u>
	3009	AVYSEILSV	<u>32</u>		3058	VFAADICGV	<u>78</u>
	3010	KMNVDVSST	<u>33</u>		3060	PAIEMQNSV	<u>79</u>
	3011	ILSVVAKL	<u>34</u>		3061	EIFNYNNHL	<u>80</u>
	3012	VLIAENTML	<u>35</u>		3062	ILKEKNAEL	<u>81</u>
	3013	KLSKNHQNT	<u>36</u>		3063	QLVHAHKKA	<u>82</u>
BFA5 Group 4	3014	SLTPLLSI	<u>37</u>	BFA5 Group 9	3065	NIQDAQKRT	<u>83</u>
	3015	SQYSGQLKV	<u>38</u>		3066	NLVDVYGNM	<u>84</u>
	3016	KELEVKQQL	<u>39</u>		3067	KCTALMLAV	<u>85</u>
	3017	QIMEYIRKL	<u>40</u>		3068	KIQCLEKAT	<u>86</u>
	3018	AMLKLEIAT	<u>41</u>		3069	KIAWEKKET	<u>87</u>
	3019	VLHQPLSEA	<u>42</u>		3070	IAWEKKEDT	<u>88</u>
	3020	GLLKATCGM	<u>43</u>		3071	VGMLLQQNV	<u>89</u>
	3021	GLLKANGCM	<u>44</u>		3072	VKTGCVARV	<u>90</u>
	3022	QQLEQALRI	<u>45</u>		3074	ALHYAVVSE	<u>91</u>
	3023	CMLKKEIAM	<u>46</u>	BFA5 Group 10	3075	QMKKKKECVL	<u>92</u>
BFA5 Group 5	3024	EQMKKKKFCV	<u>47</u>		3076	ALQCHQEAC	<u>93</u>
	3025	IQDIELKSV	<u>48</u>		3077	SEQIVEFLL	<u>94</u>
	3026	SVPNKAFEL	<u>49</u>		3078	AVIEVHNKA	<u>95</u>
	3027	SIYQKVMEI	<u>50</u>		3079	AVTCGFHHI	<u>96</u>
	3028	NLNYAGDAL	<u>51</u>		3080	ACLQRKMNV	<u>97</u>
	3029	AVQDHDQIV	<u>52</u>		3081	SLVEGTSDK	<u>98</u>

ELISPOT analysis was performed on human T-cell cultures activated through four rounds of stimulation with each pool of BFA5 peptides. Reactivity against a CMV pp65 peptide and a Flu matrix peptide were used as positive controls for T-cell activation in the experiments. Each experiment was performed with PBMC and dendritic cells from a single HLA-A*0201⁺ donor designated as “AP10”. The results show that, although BFA4 is markedly reactive with high ELISPOT counts per 100,000 cells in the assay, BFA5 is even more reactive with 9/10 pools demonstrating ELISPOT reactivity. Similar results were obtained for both BFA4 and BFA5/NYBR-1 with a different HLA-A*0201. The bars reach a maximum at 600 spots because beyond that the ELISPOT reader does not give accurate counts. Cultures having a reading of 600 spots have more than this number of spots.

Please replace paragraph [0084] with amended paragraph [0084]:

[0084] In addition to ELISPOT analysis, human T cells activated by BFA5 peptides were assayed to determine their ability to function as CTL. The cells were activated using peptide-pulsed dendritic cells followed by CD40 ligand-activated B cells (5 rounds of stimulation). The experiment shown was performed with isolated PBMC from HLA-A*0201⁺ donor AP31. Isolated T cells were tested in ⁵¹Cr-release assays using peptide-loaded T2 cells. The % specific lysis at a 10:1, 5:1, and 1:1 T-cell to target ratio is shown for T2 cells pulsed with either pools of BFA5/NYBR-1 peptides or with individual peptides. The graph shows CTL activity induced against targets loaded with a c non-specific HLA-A*0201-binding HIV peptide (control) followed by the CTL activity against the peptide pool (Pool 1 etc.) and then the activity induced by individual peptides from the respective pool to the right. A high level of cytotoxicity was observed for some peptides at a 1:1 E:T ratio. CTL activity (percent specific lysis) induced by the control HIV peptide was generally <10%. Similar results were obtained with another PBMC donor expressing HLA-A*0201 (AP10). A large number of BFA5 peptides trigger T cell-mediated cytotoxicity of BFA5 peptide-loaded target cells. **Table IV** lists those peptides having immunogenic properties. Five peptides (LMDMQTFKA (SEQ ID NO.:7), ILIDSGADI (SEQ ID NO.:29), ILSVVAKLL (SEQ ID NO.:34), SQYSGQLKV

(SEQ ID NO.:38), and ELCSVRLTL (SEQ ID NO.:70)) were found to induce both IFN- γ secretion and CTL activity in T cells from both donors.

TABLE IV

Immunoreactive peptides from BFA5

	BFA5 peptides eliciting high IFN- γ release (>200 spots/100,000 cells)		BFA5 peptides inducing CTL lysis of pulsed cells	
<u>SEQ ID NO.</u>	Donor AP10	Donor AP31	Donor AP10	Donor AP31
<u>7</u>	LMDMQTFKA	LMDMQTFKA	LMDMQTFKA	LMDMQTFKA
<u>8</u>	KVSIPTKAL			<u>KVSIPTKAL</u>
<u>9</u>	SIPTKALEL			<u>SIPTKALEL</u>
<u>11</u>	TVSQKDVCL			
<u>12</u>	SVPNKALEL			
<u>21</u>	YLLHENCML	YLLHENCML	YLLHENCML	
<u>24</u>	QLQSKNMWL	QLQSKNMWL		QLQSKNMWL
<u>28</u>	SLSKILDTV	SLSKILDTV		SLSKILDTV
<u>29</u>	ILIDSGADI	ILIDSGADI	ILIDSGADI	ILIDSGADI
<u>30</u>	KVMEINREV			
<u>32</u>	AVYSEILSV			
<u>34</u>	ILSVVAKLL	ILSVVAKLL	ILSVVAKLL	ILSVVAKLL
<u>37</u>	SLTPLLLSI	SLTPLLLSI		SLTPLLLSI
<u>38</u>	SQYSGQLKV	SQYSGQLKV	SQYSGQLKV	SQYSGQLKV
<u>40</u>	QIMEYIRKL	QIMEYIRKL		QIMEYIRKL
<u>49</u>	SVPNKAFEL			
<u>51</u>	NLNYAGDAL	NLNYAGDAL		
<u>54</u>		GVTAEHYAV		
<u>57</u>		KSQEPAFHI		
<u>59</u>	MLKLEIATL	MLKLEIATL		MLKLEIATL
<u>61</u>		MLKKEIAML		
<u>63</u>	ALRIQDIEL			
<u>67</u>		VLKKKLSEA		
<u>70</u>	ELCSVRLTL	ELCSVRLTL	ELCSVRLTL	ELCSVRLTL
<u>72</u>	SLKINLNYA	SLKINLNYA		SLKINLNYA
<u>74</u>	ATCGMKVSI		ATCGMKVSI	
<u>77</u>	AELQMTLKL		AELQMTLKL	<u>AELQMTLKL</u>
<u>78</u>		VFAADICGV		
<u>81</u>	ILKEKNAEL	ILKEKNAEL		
<u>84</u>	NLVDVYGNM		NLVDVYGNM	
<u>85</u>	KCTALMLAV			

Please replace paragraph [0085] with amended paragraph [0085]:

[0085] Polyclonal antisera were generated against the following series of 22- to 23- mer peptides of BFA5:

BFA5(1-23) KLH-MTKRKKKTINLNIQDAQKRTALHW (CLP-2977; SEQ ID NO:99)

BFA5(312-334) KLH-TSEKFTWPAKGRPRKIAWEKKED (CLP-2978; SEQ ID NO:100)

BFA5(612-634) KLH-DEILPSESKQKDYEENSWDTESL (CLP-2979; SEQ ID NO: 101)

BFA5(972-994) KLH-RLTLNQEEEEKRRNADILNEKIRE (CLP-2980; SEQ ID NO: 102)

BFA5(1117-1139) KLH-AENTMLTSKLKEKQDKEILEAEI (CLP-2981; SEQ ID NO: 103)

BFA5(1319-1341) KLH-NYNNHLKNRIYQYEKEKAETENS (CLP-2982; SEQ ID NO: 104)